

## REMARKS

Claims 1-19 are pending in the application. Herein, applicant amends independent claims 1, 11, 12 and 19.

### Section 102 Rejections

In the Office Action, the Examiner rejects claims 1, 6, 9, and 19 under 35 USC §102(b) as being anticipated by US patent no. 6,285,195 ("Needle"). Each of the independent claims 1, 11, and 19 is discussed below.

#### Response to §102 Rejection of Independent claim 1.

The applicant has amended claim 1 to indicate that the step of generating a sync signal includes using the sync signal to start a counter. A launch signal is generated responsive to the expiration of a known delay. The counter is used to count clock signals, and these clock signals are provided by an oscillator that has a time base unrelated to the timing of the launch signal. This structure effectively removes the effect of the "dead zone", while enabling the use of low cost, widely available components.

The applicant respectfully submits that Needle does not have all the limitations of amended claim 1, and therefore cannot anticipate the claimed invention. For example, Needle uses only a single time base, and that time base is used for counting as well as for starting the step generator. (See Needle, col. 4, lns. 45-53, duplicated below).

45 The digital logic 101 of the TDR uses an internal clock to  
control its activities. At some particular clock count, it will  
start an internal counter and it will activate the step generator  
102, which causes the step operation and reflections  
described above. When the digital logic 101 receives the  
50 stop signal from the stop logic, it will stop the internal  
counter. The count in the internal counter now represents the  
time between the start signal and the received stop signal,  
with the resolution of the time period of the internal clock.

Since Needle fails to disclose at least this limitation, the applicant submits that Needle can not anticipate independent claim 1 or its dependent claims 6 and 9.

Response to §102 Rejection of Independent claim 19.

The applicant has amended claim 19 to indicate that a duration signal is turned on according to a first clock, but that the duration signal is measured according to a clock that is unrelated to the first clock. This structure effectively removes the effect of the "dead zone", while enabling the use of low cost, widely available components.

The applicant respectfully submits that Needle does not have all the limitations of amended claim 1, and therefore cannot anticipate the claimed invention. For example, Needle uses only a single time base, and that time base is used for counting as well as for starting the step generator. (See Needle, col. 4, lns. 45-53, duplicated below).

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50     stop signal from the stop logic, it will stop the internal  
counter. The count in the internal counter now represents the  
time between the start signal and the received stop signal,  
with the resolution of the time period of the internal clock.

Since Needle fails to disclose at least this limitation, the applicant submits that Needle can not anticipate independent claim 19.

Section 103 Rejections of Claims 2-5 and 8

In the Office Action, the Examiner rejects claims 2-5 and 8 under 35 USC §103(a) as being unpatentable over US patent no. 6,285,195 ("Needle") in view of US patent no. 4,970,466 ("Bolles"). Since these rejected claims depend from claim 1, and as discussed above, Needle fails to disclose all the limitations, the

applicant believes claims 2-5 and 8 are allowable based on their dependency from allowable claim 1.

### **Section 103 Rejections of Claims 7 and 10-13**

In the Office Action, the Examiner rejects claims 7 and 10-13 under 35 USC §103(a) as being unpatentable over US patent no. 6,285,195 ("Needle") in view of US patent no. 5,440,528 ("Walsh"). Since claims 7 and 10 depend from claim 1, and as discussed above, Needle fails to disclose all the limitations, the applicant believes claims 7 and 10 are allowable based on their dependency from allowable claim 1.

As to independent claim 11, the applicant has made clear that the duration measurement is started using a clock that is independent of the low frequency clock signal. As discussed above, needle fails to disclose this limitation. Further, Walsh also fails to disclose this limitation, as the clock signals in Walsh are related, and operate according to the same time base. See for example, Walsh, col. 3, lns. 18-33 (duplicated below), where Walsh explains that the clocks are selected to accurately ensure that no sub-period will be addressed twice during a measurement cycle.

One exemplary embodiment is described in which the frequency of the first time base (clock A) is 9.901 MHz and the frequency of the second time base (clock B) is 20 10 MHz, with 100 launched stimulus pulses. These parameters were chosen for purposes of explanation because the number N of cycles required by clock A to effect a stimulus pulse for its entire duration results in an increment of one by clock B on each successive stimulus pulse. That is, on each successive launch of a stimulus pulse, the sub-period addressed for counting will increment by one, ensuring that no sub-period will be addressed twice during a measurement cycle. The resolution provided by this example is one nanosecond, so that time intervals proportional to distances to faults may be measured within four inches (10 centimeters) of cable.

Further, at col. 5, lns. 62-66 (duplicated below), Walsh describes how the clocks are selected to have a "beat" of 1-nano second. In this way, the clocks are not "independent" as claimed.

skipping any sub-periods. Therefore, if both clocks A and B are allowed to free run continuously, it can be appreciated that for every 100 cycles of clock A, and for every 101 cycles of clock B, the clock edges of the two clocks A and B will be coincident. For all other

Since Needle and Walsh, either alone or in combination, fail to disclose all the limitations of independent claim 11, the applicant submits that claim 11, and its dependent claims 12 and 13 are not rendered obvious by the cited references.

#### **Section 103 Rejections of Claims 14 and 15**

In the Office Action, the Examiner rejects claims 14 and 15 under 35 USC §103(a) as being unpatentable over US patent no. 6,285,195 ("Needle") in view of US patent no. 5,440,528 ("Walsh"), further in view of US patent no. 5,440,528 ("Leshay"). Since claims 14 and 15 depend from claim 11, and as discussed above, Needle and Walsh fails to disclose all the limitations, the applicant believes claims 14 and 15 are allowable based on their dependency from allowable claim 11.

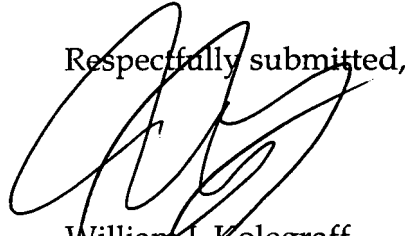
#### **Section 103 Rejections of Claims 16-18**

In the Office Action, the Examiner rejects claims 14 and 15 under 35 USC §103(a) as being unpatentable over US patent no. 6,285,195 ("Needle") in view of US patent no. 5,440,528 ("Walsh"), further in view of US patent no. 4,970,466 ("Bolles"). Since claims 16-18 depend from claim 11, and as discussed above, Needle and Walsh fails to disclose all the limitations, the applicant believes claims 16-18 are allowable based on their dependency from allowable claim 11.

### CONCLUSION

Applicant respectfully submits that pending claims 1-19 are now in a condition for allowance. If the Examiner would find it useful, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



William J. Kolegraff  
Reg. No. 41,125

Law Office of Bill Kolegraff  
3119 Turnberry Way  
Jamul, CA 91935  
Office: 19-401-8008  
Fax: 619-401-0808